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AGENCY OF ENVIRONMENTAL CONSERVATION
Department of Forests, Parks and Recreation

STATE OF VERMONT

FOREST INSECT AND DISEASE CONDITIONS
Calendar Year 1976

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VERMONT

FOREST INSECT AND DISEASE CONDITIONS REPORT
1976

INTRODUCTION

The information in this report is based on the annual statewide aerial detection survey made in late summer, two special aerial surveys made in early summer and actual field observations made by Forest Resource Protection personnel. The keen observations and dedication of our technicians make the completeness of this report possible.

Vermont experienced a wide variety of weather conditions this year beginning with a hot, dry spring which forced leafing out and insect activity earlier than normal. This unseasonal hot spell in late April was followed by an unseasonal cold spell that ended up with snow accumulating on young, tender foliage and shoots. The remainder of the growing season was very wet with above normal precipitation occuring throughout most of the state. The wet weather tended to prevent damaged foliage from browning up and this, combined with a very heavy seed crop, made aerial detection of hardwood defoliators very difficult. There was much evidence of refoliation on weather injured trees.

Last year's drought conditions, teamed with this years harsh spring appeared to accentuate the diebacks and decline of many trees, especially sugar maple and eastern larch.

FOREST INSECTS

Hardwood Defoliators

Gypsy Moth, Porthetria dispar populations increased statewide, with 50-100% defoliation occurring on 2700 acres of susceptible hardwood. The most dramatic increases occurred in northern Vermont despite the fact that extreme cold winter temperatures caused significant mortality of overwintering egg masses. Investigations of the effect of cold January temperatures on egg masses in North Hero State Park revealed that 97% of the egg masses located above 2 feet in height did not hatch. An egg mass deposition survey showed that 92% of the estimated 8000 egg masses per acre were found above the 2 foot level. However, the population of viable eggs was great enough to increase all population centers.

The Department of Forests and Parks assisted APHIS in controlling the gypsy moth population on 35 acres within the camping area by truck and back pack mist blower applications of Sevin 80S.

Another interesting study revealed that egg masses at or near

ground line were virtually unaffected by the inundation of flood waters for approximately 4 weeks. Although bleached in appearance, close to 100% of the eggs hatched.

The forest Tent Caterpillar, Malacosoma disstria population continued to build up with visible defoliation occuring on 4500 acres. The largest outbreaks occurred east of Route 100 in Stockbridge - Gaysville area. Investigations of the caterpillar population made on June 15th found a surprisinglyhigh incidence of disease present. Fall egg mass surveys indicate a high egg mass population for next year, but egg mass size is small and evidence of egg-predation was found. However, due to the increased activity observed state wide, the population trend is expected to be increasing with possibly large areas of defoliation occuring next year.

Areas receiving heavy defoliation by tent caterpillars refoliated with a general decrease in the size of the second leaf flush and subsequent bud size indicating that the trees are under stress.

The Maple Leaf Cutter, Parclemensia acerifoliella populations continued to increase in most of the infestations. Defoliation of sugar maple decreased in some of the older infestations but increased dramatically in others. Overall 34,000 acres of defoliation were mapped by air and ground detection surveys. This represents a 3,000 acre increase over 1975. Light populations of maple leaf cutter is present in most sugar maple stands. Infestations in Bennington County declined this summer possibly due to snow and heavy rain storms occuring during adult emergence.

The department and the Univeristy of Vermont continued joint field studies of the maple leaf cutter populations collecting biological and damage assessment data.

Efficacy data for registration of carbaryl to control the maple leaf cutter was also collected. Detailed reports are in process but can be briefly summarized as follows:

Spring pupal collections from 3 sugar bushes which had received heavy defoliation for the previous 3 seasons revealed the mean number of dead pupae per sugar bush ranged from 13.6% to 37.2% and averaged 23%.

Despite this population reduction, heavy defoliation occurred in all 3 of the sugar bushes sampled. Sixty-four (64) adults were captured in a 2 foot square emergence trap in the area having the highest pupae mortality indicating that the population was extremely high in that area.

Adult monitoring of spray blocks with yellow, green and white sticky traps showed a definite preference for yellow. On July 5th 240 acres of sugar maple in selected areas were sprayed with 3 formulations of carbaryl with good results.

An additional 442 acres of sugar bushes having heavy populations of leaf cutter were sprayed with 1 lb. of Carbaryl 80S under a specific exemption granted by EPA. Good control was obtained.

The Solitary Leaf Roller, Sparganathis pettitana, reported for the first time last year causing noticeable defoliation, increased from 305 acres to 836 acres of moderate defoliation.

Lighter populations were detected in many sugar bushes in Northern Vermont indicating an increasing population. Pupal parasitism is also on the increase. So far infestations have been confined to the north central section of the state.

Birch Leaf Miner, Fenusa pusilla, damage to grey birch stands was again heavy state wide. Browning is too widespread to make aerial mapping of infestations meaningful. This continues to be one of the most frequently reported shade and ornamental pests with numerous requests for identification and control received every year.

Bruce Spanworm, Operophtera bruceata, populations remained light in the northeastern part of the state with only trace defoliation reported.

Elm Leaf Beetle, Galerucella nanthomelaena, populations caused heavy defoliation of shade and roadside trees throughout most of the state with especially heavy damage occuring in Middlebury and Vergennes.

Large Aspen Tortrix, Choristoneura conflictana, populations remained present in the 11,455 acres of quaking aspen in Essex County reported in 1975 but this year defoliation was light to trace.

Green-striped Mapleworm, Anisota rubicunda, only occassional larvae were observed this year with no noticeable defoliation.

Maple Trumpet Skeletonizer, Epinotia aceriella, was found throughout the state in light numbers being especially prevalent in stands infested with the maple leaf cutter. Larval populations in areas sprayed with Carbaryl for leaf cutter were not as easily controlled as the latter insect but did average slightly better than 60% larval reduction, (based on very small sample).

Fall Cankerworm, Alsophila pometaria, were detected in light numbers in Castleton, Fair Haven and Hubbardton with no noticeable defoliation observed.

Saddled Prominent, Heterocampa guttivitta, was detected in light numbers in various parts of the state with the most noticeable populations occuring in Rutland County. No noticeable defoliation was observed and no change is expected for next year.

Fall Webworm, Hypantria cunea, was prevalent throughout the state but the number of tents appears to be declining from last year. This insect is a common urban forestry pest and the subject of many inquiries.

Locust Leaf Miner, Xenochalepus dorsalis, caused heavy defoliation of scattered groups of locust trees near Richmond along Interstate 89. Total acreage affected is approximately 10 acres.

Mountain Ash Sawfly, Pristophora geniculata, caused heavy defoliation and concern on shade and ornamental Mt. Ash trees but was scattered and caused no serious problems in high elevation Mt. Ash.

Satin Moth, Stipnotia salicis, caterpillars were not as numerous this year with the number of shade tree complaints way down from last year.

Eastern Tent Caterpillar, Malacosoma americanum, activity was observed throughout the state, being slightly heavier in the southern part where a population buildup is occuring.

Lithocolletis aceriella, a leaf miner, was common on sugar maple understory but caused no serious damage. This is the first year this insect has been widespread and noticeable.

Ugly Nest Caterpillar, Operophtera broceata, was detected in hedgerows in Danby.

The following potentially serious defoliators were not detected this year: Spring Cankerworm, Paleacrita vernata
Linden Looper, Erranis tilliarea

Softwood Defoliators

Spruce Budworm, Choristoneura fumiferana, is now established in the Northeastern part of the state. Special aerial detection flights in July revealed over 18,000 acres of probable spruce budworm defoliation. To date 2,176 acres have been ground checked and determined to be light to moderately defoliated; the remainder appears to be weather related damage or damage caused by other factors. A Spruce budworm egg mass survey is underway. Shade and Christmas tree damage decreased this season.

Larch Sawfly, Pristophora erichsonii, populations increased in the northern region, causing very heavy damage in 4 scattered plantations. In all,58 acres were defoliated.

Red Headed Pine Sawfly, Neodiprion lecontei, populations fluctuated this year increasing in some plantations and disappearing in others. Thirty (30) acres of plantation received heavy to complete defoliation.

Larch Casebearer, Coleophora laricella, appears to be increasing with control work again being necessary on European and Japanese larch in the William Putnam and Emerald Lake Seed Orchards. Malathion applied by back pack mist blowers gave good foliage protection.

Pine Needle Midge, Contarinea baeri, was widespread this year causing heavy defoliation of the upper crowns of Scotch Pine on 190 acres. Lighter but noticeable defoliation occurred in many plantations in Northern Vermont. An experimental trial using Cygon in a heavily infested plantation in Derby was unsuccessful.

Balsam Gall Midge, Dasineura balsamicola, populations remained heavy causing heavy needle drop of 1976 foliage. A total of 325 acres of sheared balsam fir Christmas trees received moderate to heavy defoliation making hundreds of trees unmarketable.

Parasite emergence was checked in an older infestation in Cabot. Over 2000 galled needles placed in rearing in the laboratory resulting in a collection of the Hymenapterous larval parasite Tetrastichas marcovitchi from 3% of the galls.

Adult emergence was monitored in May by the use of ground and sticky traps in Christmas tree plantations receiving heavy 1975 damage. Ground emergence ranged from 79 adults per square foot to 338 adults per square foot with heavy to severe damage occuring on this years new growth. Adults showed a definite color preference for clear plexiglass or yellow over blue in the sticky board trap experiment.

Ground and aerial applications of dimethoate (Cygon) were tried on an experimental basis. Malathion was applied in an attempt to reduce damage in a heavily infested plantation and in experimented plots. Ground applications of 1 to 2% cygon reduced the number of galled needles by 50% while 2% Malathion resulted in a 30% reduction in experimental plots. Heavily infested trees in a Christmas tree plantation in Derby that were sprayed by back pack mist blowers with 2% Malathion by a licensed applicator, reduced damage by about 30% but was unacceptable due to extremely heavy populations.

A Balsam-fir plantation was sprayed June 11th with dimethoate (Cygon 2E) at the rate of 1 lb. in 2 gallons of spray per acre. The results was a 38% reduction in the number of galled needles. This coupled with a decreasing population helped increase the number of salable trees in this infestation, but control was not considered satisfactory.

Red Turpentine Beetle, Dendroctonus valens, populations build-up in heavily snow damage trees in Bennington County.

The following softwood defoliators were not detected this year: yellow-headed spruce sawfly, Pikonema alaskensis; introduced pine sawfly, Diprion similis; and white pine sawfly, Neodiprion pinetum.

Aphids and Scale Insects

Balsam Woolly aphid, Adelges piceae, populations remained stable with tree mortality occuring on 18,000 acres. New infestations verified in Newport show a northward movement of this insect. Salvage operations are taking place in some of the infested areas.

Balsam Twig Aphid, Mindarus abietinus, increased noticeably in Christmas tree plantations with 500 acres of moderate to heavy damage occuring in Northern Vermont. Portions of a 10 acre plantation was aerially sprayed with dimethoate (Cygon 2E) at the rate of 1 lb. in 2 gallons of water per acre with very good results, reducing the aphid population by 97%.

Spruce Gall Aphids, Adelges species, were a common shade and ornamental pest this year. Particularly heavy damage occurred in Norway, White and Red Spruce plantations in Rutland County.

Beech Scale, Cryptococcus fagi, is discussed under Beech Bark disease.

Bud, Shoot and Stem Insects.

White pine weevil, Pissodes strobi, continues to cause widespread damage throughout the state on white pine and norway spruce. The number of trees attacked decreased slightly in Northern regions but appeared to increase in some areas of the Southern region with heavy damage occuring in a Scotch pine plantation in Ira.

Cone and Seed Insects

Conifer seed production areas. White pine, spruce and larch seed and cones received relatively little damage this year but is significant enough to warrant control plans for future seed crops.

Sugar Maple Seeds collected from superior tree candidates from many regions of the state showed little insect damage this year. The seed insects found are in rearing for later identification.

Other Insects

Extensive statewide defoliation of yellow birch was much in evidence this year. This malady was first discovered in Glastenbury Township in 1974 and labeled "Glastenbury Wilt," as the leaves appear to wilt on the tree and then fall off. Although widespread, the percent of defoliation is usually less than 15 to 20%. More investigation is needed to determine the cause agent but it appears to be the results of a leaf petiole miner.

FOREST DISEASES

Stem Diseases

White Pine Blister Rust, Cronartium ribicola, infection rate remains at a low level statewide. No Ribes control work was conducted this year.

Dutch Elm Disease, Ceratocystis ulmi, continues to cause elm mortality in urban, rural and forested areas of the state.

Verticilluim wilt, caused by Verticilluim albo-atrum appeared to increase this year. Extreme symtoms of this disease were displayed by many declining sugar maples mostly in urban or roadside situations but in most cases could not be verified by internal wood discoloration or by culturing.

Scleroderris canker, Gremmeriella abietina, appears to be causing diebacks and mortality of Scotch pine in a new location in the Northern region (Albany, Vt.) Laboratory cultures from infected branches yielded a fungus with growth and color characteristic of G. abietina but the lack of spores make a definite identification impossible. A sample of this culture plus cankered twigs is being sent to U.S.F.S. researchers in Minnesota for positive identification.

Sapstreak, a killing disease of sugar maple caused by Ceratocystis

coerulescens, was found for only the second time in Vermont by a team of U.S.F.S. pathologists investigating maple decline. A large open grown sugar maple tree in a sugar bush in Fletcher which had declined rapidly this season was cut down. It exhibited a staining pattern characteristic of sapstreak on freshly cut surfaces. Cultures from the stained wood will be identified when mature to confirm the present of this fungus.

Septoria Canker, Septuria musiva, was detected on poplar in Rutland County and Bennington County.

Fomes Pini caused severe rot in decadent and stagnant white pine stands and plantations in many areas in the state. A salvage sale is now in process at Lord State Forest.

Cytospora Kunzei, caused branch mortality on many Blue Spruce ornamentals, with occasional tree mortality occuring. Heavy infestations exist in norway spruce plantations in the Southern region.

Foliage Diseases

Lophodermium Needle Cast, Lophodermium pinastri, infections in Scotch pine Christmas tree plantations appear to be increasing due to the wet weather. Two new infections in Milton and Hyde Park were detected this year. Some Christmas tree growers are spraying periodically with fungicides to prevent infection.

Sycamore anthracnase, Gnomonia veneta, caused heavy leaf and twig damage this spring on sycamore trees.

Maple anthracnose, Gloeosporium apocrytum, was prevalent statewide on shade trees and occasionally in the forest.

Root Rots

Fomes root rot, caused by Fomes annosus, was detected in two new locations in Northern Vermont. An 11 acre red pine plantation in Craftsbury had a small packet of about 10 trees killed by F. annosus, while a larger red pine stand in Lyndon had about an acre of dead and dying trees. Infection centers in red pine plantations in Rockingham and Brattleboro are increasing in size in areas that received heavy snow damage.

Armillaria root rot, caused by Armillaria mellea, was commonly found on recently killed hard and softwood trees throughout the state. Whether the fungus is acting entirely as a secondary pathogen or whether it is actually causing decline is unknown. Armillaria is also associated with declining red spruce statewide. Salvage operations are currently going on in Mendon and Roxbury.

Diebacks, Declines and Environmental Diseases

Maple decline accelerated rapidly this year, probably due to the drought conditions of last year. The decline was especially noticeable on roadside and shade trees but was also evident in sugarbushes and hardwood stands. In some sugarbushes, various stress factors such as soil compaction

and root damage caused by grazing, poor shallow soils, insect defoliation and repeated heavy tapping were evident. Such stress factors are undoubtedly accelerated by drought and may predispose trees to attack by root decay fungi such as Armillaria mellea, which was commonly associated with declining trees. The incidence of other pathogens such as those causing Verticillium wilt and sapstreak is not presently known but needs investigation.

Ash dieback was again noticeable throughout Addison County.

Larch decline was noticeable throughout the Northern region for the first time. No causes for the dieback could be determined for areas visited other than the possibility of last year's drought conditions. In all, 232 acres were found to be in various stages of death and decline.

Spruce continues to die on large acreage in many sites but there was no evidence of an acceleration of this problem similar to that mentioned for previous species.

Pine mortality on exceedingly well-drained sandy soils in Richmond caused by last year's drought was accelerated this year by bark beetles. The area affected constitutes about 5 acres of dead red pine, Scotch pine, and white pine.

The snow storm of May 19, 1976 accounted for extensive leaf, branch and top damage with thousand's of acres of trees exhibiting off color and browning. Damage was particularly heavy in the upper elevations. Both Hardwood and Softwood species were affected.

ANIMALS

Mice damage decreased dramatically, with no complaints being received this year.

Porcupine damage continues to be low statewide, with an occasional hot spot occuring in a localized area. Control work is carried out each winter to answer complaints and requests for assistance.